



Index

Note: Page numbers of article titles are in **boldface** type.

A

- Active Compression Test (O'Brien's Test), in shoulder pain in throwing athlete, 772
- Adhesive capsulitis, following thermally assisted capsulorrhaphy in shoulder instability, 614
- Adolescent athlete, and adult, back pain in, compared, 95-96
back pain in, overview of approach to, 129-130
parents and, 130
low back pain in. See *Low back pain, in young athlete.*
spinal deformity in. See *Spinal deformity, in adolescent athlete.*
- Adolescents, synovial plicae of knee of, 468-473
- Advice, quality of, tips for evaluating, 305-307
- Aerobic conditioning, in lumbar disc injuries, 160-161
- Ambulatory surgery center(s), anesthesia in, 249
as joint ventures, 315-316
as new concept, 249
avoiding pitfalls of, 251-254
commonly performed procedures in, 257-258
equipping and supplying of, 253-254
failure of, 246
causes of, 257
financial feasibility analysis for, 253
hospital/surgeon joint ventures, 259
joint venturing of, 258-259
legal counsel for, 251-253
overbuilding of, losses due to, 253
planning for, 256-257
practice-owned office-based, advantages of, 255-256
benefits for orthopedic surgeons, 250-251
benefits for patients, 250
building successful, **249-254**
efficiency of, 255-256
pain management in, 256
pros and cons of, **255-259**
staffing of, 254
within group practice, 315
- Ancillary services, in orthopedic office, 323-324
opportunities for, analysis of, 315-316
regulation of, **305-319**
to make orthopedic office profitable, **245-247**
- Anesthesia, in ambulatory surgery centers, 249
monitored, 246
- Ankle, anatomy of, 713
arthroscopy of, thermal energy in, 767
imaging of, 715
instability of, history of, 713-715
physical examination in, 713-715
thermal energy in, **713-725**
treatment of, 715-716
ligaments of, lateral, 713, 714
- Anterior cord syndrome, hyperflexion injury and, 58, 59
- Anterior cruciate ligament, arthroscopically assisted reconstruction of, coding by orthopedic surgeons for, 243
injury of, and laxity of, thermal treatment of, **701-711**
knee bracing in, 705
MRI features of, post-shrinkage, 705, 706-709
pre- and post-shrinkage, 707
thermal treatment of, 703-705
laxity of, chronic, and posterior anterior cruciate ligament laxity, 695
electrothermal treatment of, 693, 694, 695
repair of, 693
monopolar electrothermal radiofrequency treatment of, 694-695
rupture of, radiofrequency thermal management of, 758-760

- thermal shrinkage of, **693-700**
 biomechanical tissue changes
 in, 759
 complications of, 759-760
 protection after, 699
 results of, 697-698
- Apophyseal ring, fractures of, in young athlete,
 management of, 127
- Arthroplasty, chondroplasty and, coding by
 orthopedic surgeons for, 243
- Arthroscopic surgery, of wrist, thermal energy
 in, **727-735**
- Arthroscopy, diagnostic, of shoulder, 773
 lasers in, 597
 of knee, 410-411
 role of, as diagnostic tool, 514
- Arthrotomography, magnetic resonance,
 gadolinium-enhanced, of knee, in axial
 plane, 430, 431
 of femoral trochlea, in sagittal
 plane, 427-429
 of patella, in sagittal plane, 427
 of patellofemoral joint, in axial
 plane, 418, 419, 420,
 421-425
- Articular cartilage. *See* *Cartilage, articular.*
- Athlete(s), immature, **461-482**
 throwing, capsular shrinkage in,
 771-776
 postoperative care
 following, 773
 results of, 774-775
 technique of, 773
 shoulder pain in, 771-772
- Atlanto-occipital disassociation, 64-65, 66
- Atlantoaxial disassociation, 65-67, 68
- Autotraction machine, 115
- Axial loading injury, burst fracture secondary
 to, 58
- B**
- Back, of athlete, musculature of, 94-95
 of nonathlete, degenerative conditions
 of, 95
 sprains of, 100
- Back pain, in adolescent athlete, and adult,
 compared, 95-96
 overview of approach to, 129-130
 parents and, 130
 in athlete, and nonathlete, compared,
 94-95
- diagnostic and treatment principles
 in, 97-98
 epidemiology of, **93-103**
 incidence of, 93
 predisposing factors in, 96-97
 sports-specific, 98-100
 in contact sports, 99-100
 in noncontact sports, 98-99
 low. *See* *Low back pain.*
 referred, 102
- Balance, restoration of, in lumbar disc
 injuries, 161
- Ballet, lumbar spine injuries in, 148
- Baseball, lumbar spine injuries in, 149
- Boston underarm orthosis, 85-86, 87
- Brace, Charleston night-time bending, 86, 88
- Bracing, foot orthotics, and taping, effects of,
 on pain in patellofemoral joint, 355-357
- Brain injuries, diffuse, 3
 focal, 2-3
- Burners, cervical, 9
 in athlete, **29-35**
 causes of, 30
 mechanism of injury in,
 30-32
 prevention of, 29, 34
 treatment of, 33-34
 incidence of, 101
 mechanism of injury in, 101
- Burning hands syndrome, 16
- Burst fracture, secondary to axial loading
 injury, 58
- C**
- Capsular necrosis, following thermally assisted
 capsulorrhaphy in shoulder
 instability, 615
- Capsulorrhaphy, shoulder, electrothermal
 assisted, monopolar, **599-618**
 thermal, 766, 773
 in shoulder instability, 599-600
 thermally assisted, in shoulder instability,
 604-611
 clinical results of, 615-616
 complications of, 614-615
- Carbon dioxide lasers, complications of, in
 knee surgery, 755
 development and limits of, 589-590
- Cartilage, articular, bipolar radiofrequency
 debridement of, 683

- bipolar radiofrequency devices used on, 676
 - chondromalacia and, 623
 - composition of, 620-622
 - debridement techniques, 675
 - effects of radiofrequency devices on, 649, 650, 651-659
 - fibrillated, bipolar radiofrequency treatment of, 681
 - mechanical debridement in, 663
 - histologic stains and methods to evaluate, 651
 - joint function and, 663
 - laser applications to, 663-664, 687
 - lesions of, 675
 - magnetic resonance imaging for, 417-433
 - thickness of, and treatment of, 622-623
 - unstable flaps of, radiofrequency ablation of, 682-683
 - with unstable margins, debridement in, 683
- Cartilage tissue, electron microscopy to assess, 651
- Catheter, SpineCATH intradiscal, 168
- Cell death, with thermal chondroplasty and radiofrequency energy, 635-636, 637
- Center for Medicare and Medicaid Services, 306
- Cerebral contusions, 2
- Cervical disc disease, in athlete, 37-47
 - clinical presentation and evaluation of, 40-44
 - management of, 44-45
 - pathophysiology of, 38-40
 - return to play following, 45-46
- Cervical spine, anatomy of, 7, 8
 - blunt trauma to, 64-74
 - congenital anomalies of, sports participation and, 25
 - extension injury of, 70-71
 - functions of, 7-8
 - injuries of, 7-13
 - classifications of, 62-74
 - field evaluation and early treatment of, 12
 - fractures, 10-12
 - intervertebral disc lesions, 9
 - neurapraxia, 8
 - return to play following, 12-13
 - stenosis, 10
 - stingers or burners, 9
 - transient quadriplegia, 9-10
 - multiple fractures of, hyperflexion injury and, 62
 - penetrating trauma to, 62-64
 - three columns of, components of, 60-61
 - trauma to, classification of, 49, 50
 - MR imaging in. See *Magnetic resonance imaging, in trauma to cervical spine.*
 - technical considerations in, 51-53

Cervical stenosis, role of, 32-33

transient quadriplegia in, 18-19

Charleston night-time bending brace, 86, 88

Chondrocytes, response of, to thermal injury, 627-628

Chondromalacia, 623
 - acute effects of bipolar radiofrequency energy on, 629
 - articular cartilage and, 621
 - focal, mechanical shaving and bipolar radiofrequency energy in, 639
 - model of, chondroplasty in, 628
 - of patella and trochlea, 339
 - treatment of, 623-624
 - as difficult challenge, 757-758

Chondroplasty, ablative, radiofrequency devices for, 659-660

and arthroscopy, coding by orthopedic surgeons for, 243

electrothermal, bipolar, 675-685
 - monopolar, 663-674
 - basic science of, 666-668
 - clinical considerations for, 668-670
 - popularity of, 664-665
 - surgical technique for, 669, 670-672

Holmium:YAG laser to assist in, 687-688, 689

laser, of knee, 740-744

laser-assisted, 687-692

Neodymium:YAG laser to assist in, 688, 689-690

radiofrequency energy, histologic analysis of, 649-661

thermal, principles and effects of radiofrequency energy on, 624-627

thermal energy in, 767-768

with lasers, 675

with radiofrequency energy, basic science of, 666-668
 - cell death associated with, 635-636, 637
 - clinical considerations for, 668-670
 - electrocautery with, 638-639
 - literature review of, 628-640
 - negative results of, 630

- popularity of, 664-665
surgical technique for, 669,
670-672
treatment time and, 636
thermally-assisted, basic science of,
619-647
precautions in use of, 630-640
- Clay-shoveler's fracture, 68, 69
- Closed chain exercise, in patellofemoral disorders, 378
- Coding. *See Orthopedic surgeons, coding by.*
- Collagen, effect of intradiscal electrothermal therapy on, 172-174
- Collagen(s), in cartilage, 621
shrinkage effects on, 702, 727
thermal effects on, 701-702
Type I, 727
- Compression injuries, vertical, 72-74
- Computed tomography, in spondylolisthesis, 137-138
- Computer, for appointment scheduling, 231-232
for billing, 235
for billing analysis, 234
for medical record access and location, 234
for patient history taking, 231
for template reports, 233
using voice recognition input, 233-234
for transcription, 233
in office medical practice, **231-235**
in physical examination, 232
office network and, 234-235
preparation of office note using, 233-235
- Concussion, definition of, 3-4
grading of, 5-6
- Conditioning, back pain and, 96
- Condyle, femoral, chondral flap, 676
- Consciousness, level of, evaluation of, 4
- Contusions, cerebral, 2
- Cost shifting, orthopedic surgeons and, 200
- D**
- Decompression, in spondylolisthesis, 140-141
- Dens fractures, 67
- Diagnostic tests, billing of, Medicare and, 318
supervision of, Medicare and, 318
- Disc disease, cervical. *See Cervical disc disease.*
- Discectomy, microendoscopic, in lumbar disc extrusion, 163
microscopic, in lumbar disc extrusion, 163
- Discitis, in young athlete, management of, 127-128
- Durable medical equipment, 310
- E**
- Electrocautery, with thermal chondroplasty and radiofrequency energy, 638-639
- Electromagnetic spectrum, 585-586
- Electron microscopy, to assess cartilage tissue, 651
- Electrothermal therapy, intradiscal, access and temperature mapping studies for, 174-177
clinical research review of, 178-181
diagnosis and patient selection for, 180-181
effect on collagen, 172-174
effect on nerve tissue, 171-172
in chronic discogenic low back pain, **167-187**
inclusion and exclusion criteria for, 178-179
mechanisms of action of, 177-178
overview of, 171
postoperative care following, 182-183
results of, 179-180
technique for, 181-183
- Electrothermal treatment, of laxity of anterior cruciate ligament, 693, 694, 695
- Energy, radiofrequency. *See Radiofrequency energy.*
thermal. *See Thermal energy.*
- Epidural hematomas, 3
- Equipment, improper, back pain and, 97
- Erbium:YAG lasers, 591
- E(valuation) and M(angement) requirements, orthopedic surgeons and, 200-201
- Excimer lasers, 591
complications of, in knee surgery, 755-756
- Exercise(s), alteration of demand on quadriceps and, 357-360

- closed chain, in patellofemoral disorders, 378
 - flexibility, to improve lower limb mechanics, 383-384
 - in pain in patellofemoral joint, compared, 357-360
 - isolation of vastus medialis obliquus via, 352-353
 - sport-specific, in lumbar disc injuries, 161-162
- Exercise protocols, classification of pain in patellofemoral joint and, 358-359, 360

F

- Facet joint syndrome, 153
 - Fat pad, infrapatellar, as source of knee pain, 341-342
 - Federal government, intervention of, with orthopedic surgeons, 198-199
 - Femoral trochlear dysplasia, and patellar dislocation, treatment of, 462
 - radiographic evaluation in, 461-462
 - Flexibility exercises, to improve lower limb mechanics, 383-384
 - Foot (feet), altered biomechanics of, as cause of patellofemoral joint pain, 367
 - problems of, training in, to improve lower limb mechanics, 383
 - Foot orthotics, taping, and bracing, effects of, on pain in patellofemoral joint, 355-357
 - Football player, high school, low back pain in, management of, 113-115
 - Fracture(s), avulsion, of tibial tubercle. See *Tibial tubercle, avulsion fractures of*.
 - burst, secondary to axial loading injury, 58
 - cervical, unstable, 10-12
 - clay-shoveler's, 68, 69
 - dens, 67
 - hangman's, 71-72
 - lumbar, mechanisms of, 150
 - odontoid, 67, 68
 - of apophyseal ring, in young athlete, management of, 127
 - of cervical spine, hyperflexion injury and, 62
 - of patella. See under *Patella*.
 - of spine, 101
 - stress, acute, of pars interarticularis, 96
 - teardrop, 68, 70
- Fusion, in spondylolisthesis, 141, 142, 164

G

- Glasgow coma scale, 4
- Gluteals, facilitation of, by taping, 382-383
- Gluteus medius, posterior, training of, to improve lower limb mechanics, 381-382
- Golf, lumbar spine injuries in, 149
- Gymnastics, lumbar spine injuries in, 147
- Gymnasts, back pain in, 99
 - low back pain in, management of, 115-118

H

- Hamstring tightness, back pain and, 96
- Hangman's fracture, 71-72
- Head, and neck, injured athletes, field evaluation and management of, 1-14
 - contrecoup lesion of, 1
 - coup lesion of, 1
 - injuries of, 1-7
 - bench evaluation of, 5
 - classification of, 2-4
 - on-field evaluation of, 4-5
 - return to play following, 6-7
- Health Insurance Portability and Accountability Act, orthopedic surgeons and, 201
- Health maintenance organizations (HMOs), growth of, 245
 - orthopedic surgeons and, 198-199
- Helium-neon lasers, 591
- Hematomas, epidural, 3
 - intracerebral, 2
 - subdural, 3
- Hip joint, anterior, tightness of, assessment of, 375
- Hoffa syndrome, 473-476
 - clinical features of, 474-475
 - investigations in, 475-476
 - treatment of, conservative, 476
 - surgical, 476
- Holmium:YAG lasers, 590-591
 - complications of, in knee surgery, 755-756
 - to assist in chondroplasty, 687-688, 689
- Hyperextension injury(ies), 70-72
 - with no spinal abnormality, 58, 60
 - with spondylotic changes, 59, 60
- Hyperflexion injury(ies), 67-70

- and anterior cord syndrome, 58, 59
- and multiple cervical spine fractures, 62
- and paraplegia, 53, 55, 56-57
- resulting in quadriplegia, 53, 54, 56
- without neurological impairment, 53, 54

Hyperlordosis, low back pain in, management of, 125

I

Iliotibial band, functional anatomy of, 490-491

Iliotibial band friction syndrome, 371, 490

- clinical features of, 491-492
- imaging in, 492
- management in, 492, 493
- pathogenesis of, 491
- "unload" taping in, 372

Immobilization, postoperative, in spondylolisthesis, 141

Impairment rating evaluations, 290

Impairment ratings, in private orthopedic practice, 292

Injections, therapeutic, coding by orthopedic surgeons for, 242

Injuries, acute, in immature athletes, **461-482**

Insurance collections, in orthopedic practice operations, 227-228

Interfacetal dislocation, bilateral, 68, 69

Intervertebral disc, annular tears of, 153

- injury to, 100-101
- mechanisms of, 150-151
- lesions of, in cervical injuries, 9

Intracerebral hematomas, 2

J

Jefferson's fracture, 72-73

Joint space, laxity in, 771

Jumper's knee, 487

K

Knee, anatomy of, 469

- anterior, ache in, in patellofemoral disorders, 369
- pain in, clinical implications of, 338-345
- peripatellar synovitis as cause of, 340, 341
- sources of, **335-347**

arthroscopy of, 410-411

articular cartilage of, destruction of, causes of, 340

pain in, 340, 341

bilateral total arthroplasty of, coding by orthopedic surgeons for, 243

bracing of, in anterior cruciate ligament injury, 705

embryology of, 469

examination of, in patellofemoral pain, 369-375

extensor mechanism difficulties of, outcome measurement in, **435-459**

- clinical database for, 440-454

- clinical gait assessment in, 442

- complications of, 452-454

International Knee Documentation Committee questionnaire for, 440-441

post-treatment VAS questionnaire for, 448-451, 452

radiography in, 444

surgical pathology in, 445, 446

tibiofemoral joint and patellofemoral joint assessment in, 443

VAS questionnaire for, 436-439, 442

extensor mechanism of, functional anatomy of, 483-484

overuse injuries of, **483-499**

fat pad of, anatomy of, 474

gadolinium-enhanced magnetic resonance arthrotopography of, in axial plane, 430, 431

innervation of, 336-337

laser chondroplasty of, 740-744

ligaments of, and capsule of, thermal shrinkage of, 745-746

magnetic resonance imaging of, in office, 273-276

medial patellar plica of, classification of, 470

differential diagnosis of, 471-472

radiographic evaluation of, 472

signs of, 471

symptoms and pathomechanics of, 470-471

treatment of, conservative, 472

surgical, 472-473

pain in, infrapatellar fat pad as source of, 341-342

substance P and, 338

- partial meniscectomy in, thermal energy for, 767
- surgery of, laser energy in, 739
- thermal energy in. *See Thermal energy; in knee surgery.*
- synovial plicae of, in adolescents, 468-473
- thermal modification in, 702-709
- Kyphosis, 78, 80
- Scheuermann's, management of, 125-126
- L**
- Laser(s), absorption coefficients/absorption lengths, 593-594
- applications of, on articular cartilage, 687
- to articular cartilage, 663-664
- basic configuration of, 588, 589
- CO₂, development and limits of, 589-590
- energy settings and power of, 594-595
- Erbium:YAG, 591
- excimer, 591
- for chondroplasty assist, **687-692**
- for chondroplasty of knee, 740-744
- for synovectomy, 747
- heat conduction and thermal injury from, 596
- helium-neon, 591
- Holmium:YAG, 590-591
- to assist in chondroplasty, 687-688, 689
- in arthroscopy, 597
- in meniscal lesions, 744-745
- making of, 588-589
- meaning of word, 585-586
- Neodymium:YAG, 590
- to assist in chondroplasty, 688, 689-690
- power density of, 594-595
- thermal chondroplasty with, 675
- tissue heating, clinical effects of, 595-596
- tissue interactions of, 592-593
- used in orthopedics, 589-592
- Laser energy, in knee surgery, 739
- scientific basis of, **585-598**
- Laser light, and ordinary sunlight, compared, 586-587
- formation of, 587-588
- properties of, 586-589
- Laser microscopy, confocal, to assess radiofrequency energy chondroplasty, 630, 632, 633
- Lateral patellar compression syndrome, 342-343
- Legal cases, rendering medical opinion in, 291
- Ligaments, of ankle, lateral, 713, 714
- of wrist, injuries of, 728-731
- Low back pain, chronic discogenic, intradiscal electrothermal therapy in, **167-187**
- in gymnast, management of, 115-118
- in high school football player, management of, 113-115
- in spondylolisthesis, management of, 124-125
- in spondylolysis, management of, 123-124
- in tennis player, management of, 112-113
- in young athlete, **121-132**
- diagnostic studies in, 123
- differential diagnosis of, 123-129
- history taking in, 122
- overview of approach to, 129-130
- physical examination in, 122
- lordotic, management of, 125
- management of athlete with, **105-120**
- classification of, categories of, 109, 110
- first-order, 106-107
- immobilization treatment, 111
- mobilization treatment, 110-111
- second-order, 107-108
- specific exercise, 109-110
- third-order, 108-111
- treatment-based, 106, 109
- treatment using traction, 111
- clinical scenarios for, 111-118
- Oswestry Disability Questionnaire in, 106-107
- Lower limb mechanics, improving of, in patellofemoral disorders, 380-384
- Lumbar disc, access and temperature mapping studies of, 174-177
- degenerative, pathology of, 168-170
- herniation of, pain in, 154
- pathology of, 170-171
- postoperative management in, 155
- treatment of, 154-155
- injury(ies) to, aerobic conditioning in, 160-161
- in athlete, **147-165**
- management and rehabilitation principles in, 156-164
- nonoperative care in, 156-162
- operative care in, 162-164
- restoration of balance in, 161
- sport-specific exercise in, 161-162

- trunk stabilization rehabilitation program in, 157-160
 - Lumbar fractures, mechanisms of, 150
 - Lumbar spine, clinical anatomy and biomechanics of, 149-151
 - function of, 135
 - injury(ies) to, 147-149
 - diagnosis of, 153-156
 - history and physical examination in, 151-156
 - in ballet, 148
 - in baseball, 149
 - in golf, 149
 - in gymnastics, 147
 - in running, 148
 - in water sports, 1489
 - in weight lifting, 148
 - Lumbodorsal fascia, tears of, 154
-
- M**
- Magnetic resonance arthrotomography, gadolinium-enhanced, of knee, in axial plane, 430, 431
 - of femoral trochlea, in sagittal plane, 427-429
 - of patella, in sagittal plane, 427
 - of patellofemoral joint, in axial plane, 418, 419, 420, 421-425
 - Magnetic resonance imaging, contraindications to, 410
 - cost-effectiveness assessment of, 411-412
 - dynamic, **403-415**
 - of patellofemoral joint, 407-410
 - versus static, of patellofemoral joint, 406
 - environment of, claustrophobia, anxiety, and emotional distress in, 279-281
 - equipment for, reimbursement and, 246
 - examinations, interpretation of, 285
 - extremity, safety of, 283-284
 - for articular cartilage, **417-433**
 - in identification of spinal instability, 59-62
 - in-office, **261-287**
 - extremity, economic aspects of, 284-285
 - in patients with cardiac pacemakers and ICDs, 283
 - in patients with ferromagnetic aneurysm clips, 282-283
 - in trauma to cervical spine, **49-75**
 - compatible materials for, 51
 - for characterization of spinal cord injury, 53-59
 - image quality issues in, 51-52
 - imaging protocols for, 52-53
 - joint venture in, obtaining facts concerning, 306
 - orthopedic surgeons and, 196
 - sharing and billing of, 311
 - smaller systems for, 261
 - Magnetic resonance imaging system(s), anatomic coverage and, 266
 - artifacts and, 269-271
 - ARTOSCAN-M, 264-265
 - chemical shift and, 268
 - clinical applications of, and diagnostic performance, 271-279
 - contrast-to-noise ratio and, 267
 - dedicated-extremity, types of, 261-266
 - E-SCAN and JAZZ, 265
 - extremity, accuracy of use of, 272
 - fat suppression and, 268-269
 - gadolinium enhancement and, 269
 - OrthOne, 265-266
 - patient management for, 279-284
 - patient safety and, 281-282
 - signal-to-noise ratio and, 266
 - T1-weighting and, 267
 - T2-weighting and, 267-268
 - technical considerations for, 266-271
 - Managed care, management of, 224-225
 - Managed care environment, orthopedic practice operations in, 223-229
 - "Managed care grid," 224
 - Medical equipment, durable, 310
 - Medical evaluations, independent, 289, 290, 291-292
 - deposition following, 292
 - payment for, 293
 - Medical examination(evaluation) company, in-office independent, business plan for, 295
 - clarification of purpose of, 296
 - cost-versus-benefit analysis for, 300-301
 - market analysis for, 296
 - ongoing management for, 302
 - product development and, 298-300
 - product launch and marketing for, 301-302
 - professional organizations and, 297-298
 - sources of information for, 296-297
 - state government and, 298
 - technique for formulating, 296-302
 - financial analysis of, 294-295
 - goals and expectations of, 293-294

- setting up of, **289-303**
 - state laws and requirements for, 294
 - strategic planning for, 293-295
 - Medical/legal consultation services, in private orthopedic practice, 291
 - payment for, 293
 - worker's compensation and, 292
 - Medical/legal services, definition of, 290
 - litigation and, 290-291
 - Medical opinion, rendering of, in legal cases, 291
 - Medical practice, computer in, **231-235**
 - Medical practice management groups, orthopedic surgeons and, 197
 - Medical terminology, changing, orthopedic surgeons and, 200
 - Medicare, billing for diagnostic tests, 318
 - Federal government intervention and, 198-199
 - supervision of diagnostic tests and, 318
 - Medicare antikickback statute, 305, 306, 307-308
 - advisory opinion program and, 308
 - HIPPA and, 308
 - safe harbors in, 307-308
 - Stark Law and, compared, 309
 - ventures not qualifying for, 308
 - violation of, 307
 - Mediopatellar plica, impingement of, 340
 - Miscellaneous lesions, laser applications in, 744-745
 - Meniscectomy, partial, in knee, thermal energy for, 767
 - partial medial, and chondroplasty, coding by orthopedic surgeons for, 243
 - Milwaukee brace, 82, 83-84, 85
 - Monitored anesthesia care, 246
 - Movie sign, 369
 - Muscle(s), imbalance of, as cause of patellofemoral joint pain, 367
 - in control of patella, **349-362**
 - stretching of, to improve lower limb mechanics, 383-384
 - training of, in disorders of patellofemoral joint, 377-380
 - Neodymium:YAG lasers, 590
 - complications of, in knee surgery, 755-756
 - to assist in chondroplasty, 688, 689-690
 - Nerve(s), of knee, 336-337
 - Nerve injury, axillary, following thermally assisted capsulorrhaphy in shoulder instability, 614
 - Nerve tissue, effect of intradiscal electrothermal therapy on, 171-172
 - Neural growth factor, patellofemoral malalignment and, 344-345
 - Neurapraxia, cervical cord. See *Quadriparesis, transient*.
 - Nucleus pulposus, herniated, in young athlete, management of, 126-127
 - management of, 100-101
- O**
- Occupational therapy, billing for, 317-318
 - Odontoid fracture(s), 67, 68
 - Orthopedic office, ancillary services in, 323-324
 - to make it profitable, **245-247**
 - co-payment collection by, 224
 - front desk operations in, 223
 - group size and, 247
 - Orthopedic practice, aggressive management for, 324
 - delegation of responsibility in, 322-325
 - efficient, enjoyable, and profitable, **321-325**
 - group size and, 324
 - improvement of performance in, 322
 - members of clinical team for, 322
 - office efficiencies for, 322
 - physician assistant in, 322, 323
 - private, impairment rating evaluations in, 292
 - medical/legal consultation services in, 291
 - record reviews in, 292
 - quality of care in, 321
 - quality of income in, 321
 - quality of life in, 321
 - restructuring of practice environment, 321
 - Orthopedic practice operations, additional reimbursement in, 227-228
 - appeal process in, 226
 - billing and collections by, 225-226, 228
 - coding and reporting in, 226
 - improvement of, and maximizing reimbursement in, **223-229**
- N**
- Neck, and head, injured athletes, field evaluation and management of, **1-14**

- in managed care environment, 223-229
 - insurance collections in, 227-228
 - patient collections for, 228-229
 - patient satisfaction with, 229
 - verification of eligibility status of patient, 224
- Orthopedic surgeons, assessment of group's leadership, in management changes, 216
- bundling rules and, 240-241
 - business principles in medicine and, 203-204
 - changing medical terminology and, 200
 - chief complaint of, 195
 - clinical evaluation of, 201
 - clinical impression and, 202-203
 - clinical laboratory and, 196
 - co-morbidity and, 199-201
 - coding and reimbursement of, 240-242
 - coding by, examples of, 242-244
 - for arthroscopically assisted anterior cruciate reconstruction, 243
 - for arthroscopy and chondroplasty, 243
 - for arthroscopy with mini rotator cuff repair, 243-244
 - for arthroscopy with partial medial meniscectomy and chondroplasty, 243
 - for bilateral total knee arthroplasty, 243
 - for shoulder arthroscopy and shrinkage capsulorrhaphy, 243
 - for therapeutic injections, 242
 - use of correct, 240
 - competition among, as increasing, 212-213
 - correct coding for, 237-244
 - cost shifting and, 200
 - diagnostic coding for, 237-238
 - diagnostic tests for, 202
 - Dx and Rx for, 195-222
 - E(valuation) and M(angement) requirements and, 200-201
 - failure to form debate in public policy, 220
 - federal government intervention and, 198-199
 - global surgical period and, 242
 - Health Insurance Portability and Accountability Act, 201
 - health maintenance organizations and, 199
 - "history of present illness" of, 195-196
 - in-office contracted services and, 215
 - in-office x-ray and, 196
 - lack of equity of, 217-220
 - lack of negotiating power by, 216
 - lack of understanding of human resources by, 220
 - loss of collegiality in profession, 205
 - loss of income of, 206
 - remedies for, 207-212
 - magnetic resonance imaging and, 196
 - marketing of services of, 211-212
 - medical practice management groups and, 197
 - mobile and portable practice for, 214-215
 - out-patient surgery centers and, 197
 - past history of, 197-199
 - Patients Bill of Rights and, 201
 - physical therapy and, 196
 - physician group compensation plans and, 217
 - physician/patient dialog and, 203
 - practice profile pressures/downsizing by, 213
 - remedies for, 213-216
 - procedural coding for, 238-240
 - professional loss of mission, 204
 - prognosis for, 221
 - regulations for, compliance with, 206
 - reimbursement methods and, 200
 - resistance to change, 204
 - strategic alliances for, 215
 - treatment considerations and, 203-221
 - use of codes for follow-up, 242
 - use of modifiers by, 241-242
 - work values of, 204-205
- Orthopedics, lasers used in, 589-592
- Orthosis, Boston underarm, 85-86, 87
- thoracolumbosacral, 85-86, 87
- Osgood-Schlatter disease, 467, 476-479
- causes of, 477
 - clinical features of, 477
 - natural history of, 478
 - radiographic evaluation in, 477-478
 - treatment of, 478-479
- Osteomyelitis, vertebral, in young athlete, management of, 127-128
- Osteonecrosis, complications of thermal energy in knee surgery in, 756-757, 758
- Oswestry Disability Questionnaire, in low back pain, 106-107
- Out-patient surgery centers, orthopedic surgeons and, 197
- Overuse injuries, of extensor mechanism of knee, 483-499
-
- P**
- Pain, anatomy of, 337-347
- free nerve endings and, 337, 338

- in subchondral bone, pressure as cause of, 342
 - turnover and remodeling causing, 343
 - mechanoreceptors and, 337-338
 - physiology of, 335-336
 - stimuli eliciting, 335
- Pain management, in ambulatory surgery center, 256
- Pain receptors, 336
- Paraplegia, hyperflexion injury and, 53, 55, 56-57
- Pars interarticularis, acute stress fractures of, 96
 - defect of, low back pain in, management of, 123-125
- Patella, alignment of, factors influencing, 404
 - anatomy of, 421-422, 426
 - avulsion fractures of, 464
 - biologic resurfacing of, **549-575**
 - abrasion arthroplasty in, 553-555
 - and growth factors in cartilage repair, 567-568
 - autogenous osteochondral grafting in, 558-561, 562, 563
 - autologous chondrocyte implantation in, 563-566
 - by implantation of bone
 - marrow-derived autogenous mesenchymal progenitors, 567
 - fresh osteochondral allografts in, 568-570
 - interposition arthroplasty in, 550-551
 - "microfracture" technique in, 555-558
 - Stone procedure in, 561-563
 - subchondral drilling in, 551-553
 - types of procedures for, 549-550
- chondromalacia of, 339
- cryosectional anatomy of, in sagittal plane, 425, 427, 428, 429, 430
- dislocation of, 461
 - abnormalities associated with, 389
 - acute, reinjury in, 502
 - and femoral trochlear dysplasia, treatment of, 462
 - definition of, 501
 - etiology of, and risk factors for, 503-506
 - natural history of, 501-502
 - population prone to, 503
 - reconstruction of medial patellofemoral ligament in, 515
 - surgical management of, 512-513
 - displacement of, in normal knees, 507
 - functions of, 364-365
 - innervation of, 337
 - instability of, contributions to, 506-508
 - definition of, 501
 - displastic factors in, 516
 - trochlear dysplasia and, 504-505, 516
 - lateral, compression syndrome of, 342-343
 - dislocation of, current concepts of, **501-521**
 - thermal capsular release of, 746-747
 - magnetic resonance arthrotomography of, in sagittal plane, 427
 - maltracking, as cause of chondromalacia, 339
 - medial soft tissue stabilizers of, anatomy of, 508
 - mobility of, variations in, 507
 - muscular control of, **349-362**
 - muscular innervation-neuromuscular drive in, 350
 - partial rupture of, 488
 - position of, criteria to describe, 407-408
 - determination of, supine examination for, 374
 - factors influencing, 406
 - relative to trochea, 523-524
 - positional abnormalities of, radiographic techniques to assess, 397-398
 - sleeve fractures of, 464-466
 - clinical features of, 465
 - mechanism of injury in, 465
 - radiographic evaluation in, 465
 - treatment of, 465-466
 - subluxation(s) of, 461
 - lateral, 389
 - lateral retinacular release in, 513-514
 - medial, 462-463
 - treatment concepts in, 463
 - radiologic techniques for screening, compared, **389-401**
 - study results of, 398-400
 - taping of, in patellofemoral disorders, 376-377
 - tendinopathy of, clinical grading of, 488
 - conservative management of, 489
 - history and physical examination in, 487-488
 - pathophysiology of, 484, 485
 - surgical management of, 489-490
 - tendonitis of, 370-371
- Patella alta, 503, 504
- Patellar tendon, disorders of, imaging in, 489
 - overuse lesions of, site of, 484-487

- Patellar tendon graft, chronic, before radiofrequency electrothermal shrinkage, 695-697
- Patellofemoral joint, anatomic conditions
- influencing, 403-404
 - anatomy of, 363-364
 - compliance of, measurement of, 507
 - congruence angle of, 405
 - cryosectional anatomy of, in axial plane, 422-423
 - disorders of, biomechanical
 - considerations in, 365
 - dynamic examination in, 373-374
 - muscle training in, 377-380
 - nonoperative management of, evidence for, 384
 - physical therapist's approach to, 363-387
 - prone examination in, 375
 - Q angle and, 366-367
 - side-lying examination in, 375
 - static examination in, 371-373
 - supine examination in, 374
 - treatment of, 375-380
 - unloading in, 377, 378
- dual-plane cryosectional anatomy of, 419-420
- dynamic magnetic resonance imaging of, 407-410
- dynamic versus static magnetic resonance imaging of, 406
- imaging of, 404-406
- innervation of, 336-337
- instability of, 370
- origins of, 405
- kinematic, magnetic resonance imaging of, 276
- lateral, pressure in, 342-343
- magnetic resonance arthrography of, in axial plane, 418, 419, 420, 421-425
- malalignment of, 523-548
- and torsion, clinical association of, 534-536
 - anteriorization of tibial tubercle in, 540
 - articular cartilage condition changes and, 531
 - articular geometry assessments in, 529-530
 - assessment of bony alignment in, 528-529
 - definition of, 525-526
 - evaluation of, 526-527
 - evaluation of ligament integrity in, 530
 - history taking in, 526
 - imaging studies in, 531-532
 - limb alignment assessments in, 532
 - muscular strength and timing assessments in, 530-531
 - normal torsion and, 534
 - pathobiologic mechanisms in, 345
 - pathogenesis of, 525
 - pathophysiology of, 526
 - physical examination in, 527-531
 - Q angle measurements in, 528-529
 - retinacular nerve damage in, 344
 - rotational deformity in, correction of, 541-542
 - soft-tissue realignment surgery in, 536-538
 - surgery in, 536
 - tibial tubercle transfers in, 538-540
 - torsion on patellofemoral joint and, 533
 - surgery for, 541
 - treatment of, 536
- morphology of, in axial plane, 418-419
- patients and methods of study of, 419-421
- subchondral osseous, 417
- pain in, altered foot biomechanics as cause of, 368-369
- biomechanical faults as cause of, 366-367
- classification of, 365-366
- exercise protocols and, 358-359, 360
- differential diagnosis of, 369
- effects of taping, foot orthotics, and bracing on, 355-357
- exercises in, compared, 357-360
- factors predisposing to, 365-369
- impact of, in quadriceps activation, 354-355
- muscle imbalance as cause of, 367-368
- soft-tissue tightness as cause of, 367
- symptoms of, 369
- radiographic analysis of, from axial view, 393, 395
- from lateral aspect, 390-393, 394, 395-397
- materials and methods for, 393-395
- results of, 395-397
- reaction force, 365
- rehabilitation of, quadriceps strengthening in, 378
- stability of, medial patellofemoral ligament in, 510-511
- structures of, 335, 336
- subluxations of, 370
- Patellofemoral ligament, medial, 508-510
- biologic considerations and, 512
 - clinical significance of, 510-511
 - reconstruction of, in patellar dislocation, 515

- Patellofemoral pain syndrome, 389, 390, 392
- Patients Bill of Rights, orthopedic surgeons and, 201
- Pelvis, motion of, assessment of, in patellofemoral disorders, 373
stability of, improvement of, in patellofemoral disorders, 380-383
- Peripatellar synovitis, as cause of anterior knee pain, 340, 341
- Pharmacy, in-office, profit from, 247
- Physical therapy, billing for, 317-318
in patellofemoral disorders, 375-376
orthopedic surgeons and, 196
- Physician encounter time, 323
- Physician-reviewer, stereotypical, 291

Q

- Q angle, definition of, 515
disorders of patellofemoral joint and, 366-367
- Quadriceps, activation of, impact of pain in patellofemoral joint and, 354-355
alteration of demand on, exercises and, 357-360
strengthening of, in rehabilitation of patellofemoral joint, 378
isolation of vastus medialis obliquus and, 353
- Quadriceps angle. See *Q angle*.
- Quadriceps tendon, partial ruptures of, 495, 496
tendinopathy of, 492-496
clinical aspects of, 494
history and physical examination in, 494
imaging in, 495
management of, 495-496
- Quadripareisis, transient, 101-102
evaluation in, 22-23
in athlete, 15-27
in cervical stenosis, 18-19
in injuries of cervical spine, 8
mechanism and pathophysiology of, 16-18
return to play criteria in, 23-25
risk of, 19-22
synopsis of, 15-16
- Quadriplegia, hyperflexion injury resulting in, 53, 54, 56
transient, in cervical injuries, 9-10
- R**
- Racquet sports, back pain in, 99
- Radiofrequency, 693
electrothermal energy delivered by, 693
- Radiofrequency devices, ablative, controversy concerning, 659-660
bipolar, 650
basic science of, 676-680
clinical studies using, 680
modification of articular soft tissue using, 676
surgical technique for, 680-683
effects on articular cartilage, 649
studies of, 650, 651-659
monopolar, 650
- Radiofrequency electrothermal treatment, chronic patellar tendon graft before, 695-697
semitendinosus/gracilis tendon graft following, 697-698
- Radiofrequency energy, advantages of, 619-620
bipolar, progressive cartilage loss following, 640
circuitry for use in orthopedics, 665-666
commonly used devices, compared, 631-632, 634-635
cooled probes, 626
development of, 624
heat loss and, factors causing, 625-626
heat production and, 625
monopolar versus bipolar, 664, 665
principles of, 624-625
and effects on thermal chondroplasty, 624-627
and goals of, 627
temperature measurement and, 627, 637
uses of, 619, 624
with thermal chondroplasty. See under *Chondroplasty*.
- Radiofrequency energy chondroplasty, histologic analysis of, 649-661
- Radiofrequency probes, 765-766
- Radiology, as joint ventures, 316-317
within group practice, 316
- Record reviews, in private orthopedic practice, 292
- Reduction of slips, in spondylolisthesis, 143
- Reimbursement, maximizing of, improvement of orthopedic practice operations and, 223-229
methods of, for orthopedic surgeons, 200
- Retinaculum(a), nerve fibers in, anterior knee pain and, 343-344

- Return to play, following injuries of cervical spine, 12-13
 following transient quadriplegia, 23-25
- Rotational instability, 772
- Rotator cuff repair, mini, arthroscopy with, coding by orthopedic surgeons for, 243-244
- Runners, back pain in, 98
 lumbar spine injuries in, 148

S

- Sacroiliac joint, pain in, 154
- Safranin-O stain, 651
- Scheuermann's kyphosis, 78, 80
 management of, 125-126
- Scoliosis, 78, 79
 gymnastics and, 81
 in swimmers, 80, 81
 surgical correction of, 87-88, 89
 water skiing and, 81
- Semitendinosus/gracilis tendon graft, following radiofrequency electrothermal treatment, 697-698
- Shoulder, arthroscopy of, and shrinkage capsulorrhaphy of, coding by orthopedic surgeons for, 243
 diagnostic, 773
 instability of, anterior unidirectional, 607-609, 610
 arthroscopic thermal stabilization techniques in, 603-604
 arthroscopic treatment of, 599
 diagnostic arthroscopy in, 607, 608
 evaluation and decision-making in, 602-604
 history and physical examination in, 602
 multidirectional, 611
 post-operative rehabilitation in, 611-614
 posterior, 610-611
 preoperative work-up in, 602-603
 surgical indications in, 603-604
 surgical technique in, examination for, 605
 portals for, 605-606, 607
 positioning for, 605, 606
 technical considerations in, 604-605
 thermal capsulorrhaphy in, 599-600
 thermally assisted capsulorrhaphy in, 604-611
 clinical results of, 615-616
 complications of, 614-615
 traumatic, 611
 internal impingement in, 772
 magnetic resonance imaging of, in-office, 276-279, 280
 pain in, in throwing athlete, history taking in, 771-772
 physical examination in, 772
 thermal energy to treat, 767
 throwing, symptomatic, "active rest" in, 773
- "Shoulder Lachman" examination, 772
- Sinding-Larsen-Johansson disease, clinical features of, 479
 investigations of, 479-480
 treatment of, 480
- Soft tissue, elasticity of, 771
 medial stabilizers of, anatomy of, 508
 tightness of, as cause of patellofemoral joint pain, 367
- Spear teckler's spine, 23, 25-26
- Spinal column, biomechanical functioning of, 151
- Spinal deformity, in adolescent athlete, 77-92
 athletic participation and, 82
 bracing in, 82-87
 incidence of, 80-82
 surgical correction of, 87-90
 treatment of, athletic participation after, 82-90
- Spinal instability, MR imaging in identification of, 59-62
- Spine, and sports, 1-187
 cervical. See *Cervical spine*.
 development of, risks of athletics on, 78-80
 fractures of, 101
 lumbar. See *Lumbar spine*.
 neoplastic processes in, in young athlete, management of, 128-129
 normal growth of, 77-78
 posterior superior iliac, pain in, 154
 vulnerability to injury, 95
- Spondylolisthesis, 101
 bone spans in, 137
 C2 traumatic, 71, 72
 classification of, 134
 computed tomography in, 137-138
 diagnosis of, 136
 grades of, 136
 in athlete, 133-145
 isthmia, etiology of, 134-135
 prevalence of, 133

- low back pain in, management of, 124-125
 risk factors for, 133-134
 surgery in, indications for, 140
 procedures for, 140, 164
 symptoms of, 135-136
 treatment of, 138-140, 164
- Spondylolysis, 101
 low back pain in, management of, 123-124
 treatment of, surgical, 140
- Sports, contact, back pain in, 99-100
 noncontact, back pain in, 98-99
 spine and, 1-187
- Sprains, of back, 100
- Stark Law, 305, 309-310
 antikickback statute and, compared, 309
 compensation formula issues and, 311-312
 definition of referral by, 309
 durable medical equipment and, 310
 exceptions covering compensation relationships and, 313
 exceptions for ownership interests and, 312-313
 fair market value exception and, 313
 financial relationships protected by, 310
 health services covered by, 309-310
 in-office ancillary services and, 310-311
 leases and, 313
 nonmonetary compensation and, 314
 payments to employees and, 313
 per-click payments and, 314-315
 prohibitions of, 309
- State antikickback laws, 305, 315
- Step training, in patellofemoral disorders, 379, 380
- Stereotypical physician-reviewer, 291
- Stinger syndrome. See *Burners, cervical*.
- Stress fracture(s), acute, of pars interarticularis, 96
- Subchondral bone, pain in, pressure as cause of, 342
 turnover and remodeling causing, 343
- Subdural hematomas, 3
- Substance P, pain in knee and, 338
- Subtalar joint, mobilization of, to improve lower limb mechanics, 383
- Surgery centers, ambulatory. See *Ambulatory surgery center(s)*.
- Surgicenter, in-office, 246
- Synovectomy, laser techniques for, 747
- Synovium, as pain receptor, 340
- ## T
- Taping, foot orthotics, and bracing, effects of, on pain in patellofemoral joint, 355-357
- Team encounter time, 323
- Teardrop fracture, 68, 70
- Tendinopathy, definition of, 487
- Tendon(s), disorders of, nomenclature in, 487
 patellar, disorders of, imaging in, 489
 overuse lesions of, site of, 484-487
- Tennis player, low back pain in, management of, 112-113
- Thermal capsular release, of lateral patella, 746-747
- Thermal capsular shrinkage, in throwing athlete, 771-776
 postoperative care following, 773
 results of, 774-775
 technique of, 773
- Thermal capsulorrhaphy, 773
- Thermal energy, applications of, 765
 current technique for, 766
 damage caused by, 688-689
 effects on collagen, 701-702
 feedback to indicate need for, 766
 for partial meniscectomy in knee, 767
 future trends in, 765-770
 in ankle arthroscopy, 767
 in ankle instability, 713-725
 basic science of, 716
 complications of, 722-723
 postoperative treatment in, 720-721
 results of, 721-722
 technique of, 716-720
 in arthroscopic surgery of wrist, 727-735
 in knee surgery, advantages of, 754-755
 clinical uses and complications of, 740-747
 complications of, 737-751, 753-763
 in CO₂ laser use, 755
 in Nd:YAG, Ho:YAG, and excimer laser use, 755-756
 in osteonecrosis, 756-757, 758
 current uses of, 737-738
 mechanism of action of, 753-754

- methods of delivery of, 738-740
 - in modification of knee, 702-709
 - postoperative rehabilitation following, 766-767
 - tissue response and, 769
 - to treat anterior cruciate ligament injury and laxity, **701-711**
 - to treat shoulder, 767
- Thermal injury, response of chondrocytes to, 627-628
- Thermal shrinkage, of anterior cruciate ligament. See *Anterior cruciate ligament, thermal shrinkage of.*
- Thermally-assisted chondroplasty, basic science of, **619-647**
- precautions in use of, 630-640
- Thoracolumbosacral orthosis, 85-86, 87
- Throwing athlete, capsular shrinkage in, **771-776**
- postoperative care following, 773
 - results of, 774-775
 - technique of, 773
 - shoulder pain in, 771-772
- Tibial tubercle, avulsion fractures of, 466-468
- classification of, 466-467
 - clinical features of, 467
 - complications of, 468
 - investigations in, 467
 - mechanism of injury in, 466
 - treatment of, 467-468
 - transfer of, for stabilization of patella, 515-516
- Triangular fibrocartilage complex, tears of, 731-733
- Trochlea, chondromalacia of, 339
- dysplasia of, patellar instability and, 504-505, 516
 - femoral, anatomy of, 421-422, 426
 - dysplasia of, 461-462
 - magnetic resonance arthrotomography of, in sagittal plane, 427-429
- Trunk stabilization rehabilitation program, in lumbar disc injuries, 157-160
-
- U**
- Ulnar impaction syndrome, 733, 734
-
- V**
- Vastus lateralis, 364
- taping to inhibit, 370
- Vastus medialis longus, 364
- Vastus medialis obliquus, 349, 350, 364
- action in terminal extension, 350-352
 - activation of, timing of, 353-354
 - and quadriceps, training of, 379, 380
 - isolation of, via specific exercise, 352-353
-
- W**
- Water sports, lumbar spine injuries in, 148
- Weight lifters, back pain in, 98-99
- lumbar spine injuries in, 148
- Wrist, arthroscopic surgery of, thermal energy in, **727-735**
- ligamentous injuries of, 728-731

